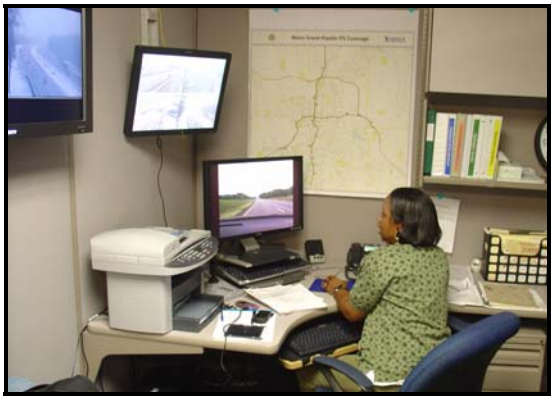
WEST MICHIGAN TRAFFIC MANAGEMENT CENTER

FISCAL YEAR 2008 ANNUAL REPORT



Prepared For:

MDOT
Michigan Department of Transportation

MICHIGAN DEPARTMENT OF TRANSPORTATION
GRAND REGION OFFICE
GRAND RAPIDS, MICHIGAN

Prepared By:

URS

DETROIT – SOUTHFIELD – GRAND RAPIDS – TRAVERSE CITY

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1. PURPOSE

The Michigan Department of Transportation (MDOT) Grand Region operates the West Michigan Traffic Management Center (WMTMC), which is co-located with the Grand Region Office north of downtown Grand Rapids, Michigan. The WMTMC strives to improve the performance and safety of the Grand Rapids metropolitan area freeway system by utilizing the latest developments in transportation technologies and by strengthening interagency cooperation and collaboration. The goals of the WMTMC include improving traffic incident response, reducing secondary collision rates, informing motorists of current traffic conditions, and reducing congestion along freeways throughout the region.

This report presents an overview of WMTMC operations during MDOT Fiscal Year (FY) 2008 (October 1, 2007 – September 30, 2008). Current WMTMC operations include daily control room functions, messaging for construction activities, special events, and traffic incident management.

2. CONTROL ROOM OPERATIONS

The WMTMC collects and disseminates travel information across approximately 22 miles of freeway in the Grand Rapids Metropolitan Area. Data collection resources include traffic surveillance cameras, MDOT employees, county and city road agencies, law enforcement, media traffic partners, and other organizations. Control Room Operators at the WMTMC manage incidents and disseminate real-time travel information via Dynamic Message Signs (DMS) strategically located throughout the freeway system, Variable Speed Signs (VSS) along the US-131 S-Curve, and communication with media partners, law enforcement, and other local and county agencies. The locations of existing traffic cameras and DMSs, as well as the operating hours of the control room, can be found in Appendix A, *Fiscal Year 2008 Performance Measures Report.*

3. CONTROL ROOM COMMUNICATIONS

A key function of daily control room operations involves Control Room Operators communicating in real-time with law enforcement and media partners as traffic incidents unfold. When Control Room Operators are able to detect and verify a traffic incident, they assist in coordinating emergency response with Michigan State Police (MSP) and Grand Rapids Police Dispatch (GRPD), provide traffic information to local media partners, and continue to monitor the incident scene for the purpose of updating DMS messages and incident notifications. In addition, Control Room Operators communicate with project engineers and contractors working on a number of road construction projects, maintenance crews working along the highways in the region, and personnel in charge of maintaining and repairing ITS devices. The WMTMC control room communicates on occasion with agencies, such as the West Michigan Clean Air Coalition (WMCAC) in reference to Ozone Action Days, utility companies regarding power and communications to ITS field devices, and the Michigan ITS Center (MITSC) in Detroit. During FY 2008, the control room handled approximately 1,100 incoming and outgoing calls. In

addition to phone calls, control room operators handled approximately 1,800 incoming and outgoing e-mail messages in FY 2008.

Control Room Operators also have the ability to communicate via an 800-MHz radio with Michigan State Police (MSP) dispatchers. Although the radio is primarily used as a backup system to other forms of communication, it is still an important tool for ensuring the ability of the control room to communicate in the event of an emergency.

Table 1. Distribution of WMTMC Control Room Telephone Calls and E-mails

The WMTMC Control Room Operators maintain a log of all telephone calls to and from the control room, including the name, phone number, and agency of each person as part of the Event Log. A breakdown of the number of calls and e-mails by category during FY 2008 is provided in Table 1.

	Calls			Emails		
Agency	**In**	**Out**	**Total**	**In**	**Out**	**Total**
City of Grand Rapids	0	0	0	300	0	300
City of Wyoming	0	4	4	0	0	0
Grand Rapids Police Department	46	721	767	0	0	0
Kent County Road Commission	5	19	24	7	1	8
MDOT, Construction	29	29	58	268	2	270
MDOT, Traffic/ITS	0	0	0	89	2	91
MDOT, Maintenance	11	7	18	130	1	131
MDOT, Other	4	7	11	340	1	341
Media	17	5	22	38	94	132
Michigan State Police	4	73	77	0	0	0
URS Corporation	16	15	31	74	10	84
ITS System Maintenance*	17	56	73	0	0	0
Weather**	0	0	0	349	0	349
Other	8	8	16	102	2	104
Month Total	**157**	**944**	**1101**	**1697**	**113**	**1810**

*All communications in this category were with the City of Grand Rapids
**No data was recorded in this category before Dec '07

4. CAMERA, SIGN, AND VEHICLE DETECTOR OPERATIONS

The WMTMC utilizes a network of ITS devices to monitor traffic conditions and inform motorists of important traffic situations throughout the Grand Rapids area. ITS field devices are connected to the WMTMC via a combination of fiber optic and wireless connections. At the end of FY 2008, the ITS network covered approximately 22 centerline miles of freeway in the Grand Rapids metropolitan area, and included:

- 17 traffic cameras
- 10 dynamic message signs
- 4 variable speed signs

A key method of obtaining traffic information is automatic detection of current conditions. This is typically done using a network of detectors that are capable of calculating vehicle volumes,

speeds, and sizes, that are connected to a traffic management center via a data network. This data can then by used by operators to detect possible incidents and provide up-to-date travel information to the motoring public.

The WMTMC obtained a portable vehicle detection trailer during FY 2007 for the purpose of observing traffic information and sending data to the WMTMC control room. The detection trailer is set up alongside a roadway and, using microwave radar technology, collects vehicle volume and speed information. The detection trailer is powered via solar panels and batteries and utilizes a cellular modem to transmit data to the control room. The detection trailer was used on several projects on M-37 (East Beltline Avenue) during FY 2008 to study how construction impacted traffic volumes and patterns.

No new cameras or signs were installed within the existing ITS network during FY 2008, though infrastructure was put in place to add additional cameras and a sign to the network. The additional cameras and sign will be installed in FY 2009. Design work continued on an inter-agency project that will expand the current ITS network and will add dozens of ITS devices throughout the region, including cameras and signs, with the majority of the devices on arterial, non-freeway routes. This project is expected to begin construction in FY 2009.

The City of Grand Rapids installed 50 cameras in FY 2008 on City streets. Sixteen of the cameras are currently online and the Control Room Operators are able to control and view them from the Control Room. In addition to the cameras, new software was installed that enables the operators to control all of the cameras much easier.

The WMTMC utilizes a network video server that allows anyone on the state network to view the same video feeds that the operators are viewing in the control room. Since the server is on the state intranet, it is not available to the general public. The server has been helpful in allowing MDOT engineers and MSP dispatchers to gather more accurate information about traffic conditions and incidents without being in the WMTMC control room. The interface for the Axis Video Server is shown in Figure 1.

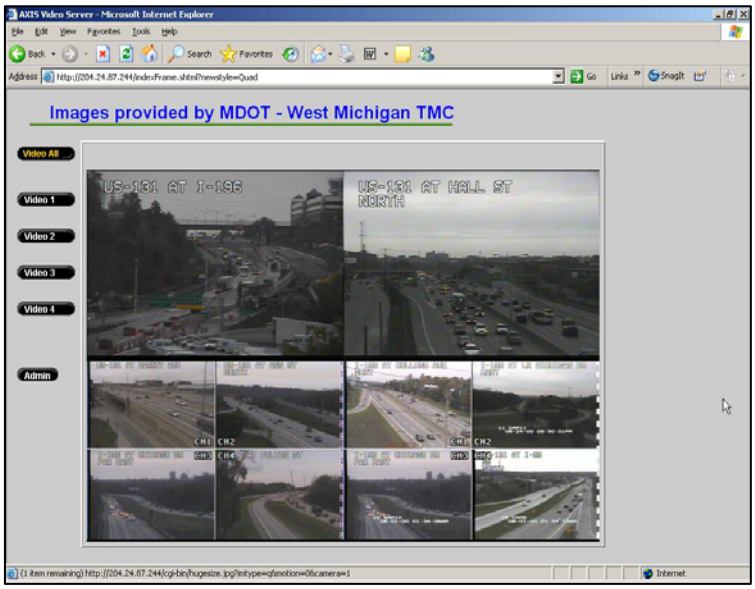

Figure 1. Axis Video Server

Video feeds are also shared with the media, including radio traffic reporters. Providing access to live video for rush hour traffic reporting is an important aspect in getting real-time information to motorists. Four local television stations have contract agreements in place with MDOT and are currently broadcasting live camera feeds during their news programs. By including images as part of a television traffic report, the public is able to easily observe current traffic conditions and make more informed travel decisions. Each television station is able to select from 16 video feeds of broadcast-quality images using an interface known as PelcoNet.

The WMTMC camera images are made available to the general public via the Mi Drive website, at www.michigan.gov/drive. The images on the Mi Drive website automatically update at a rate of up to one image every two seconds, providing snapshots of current traffic conditions for motorists. The Mi Drive site contains other traffic information such as construction closures. As additional equipment is installed and software is upgraded within the ITS network, additional travel information, such as travel speeds, will be added to the Grand Rapids portion of the website, similar to what is available on the Detroit portion of the website. A snapshot of the Mi Drive website is shown in Figure 2.

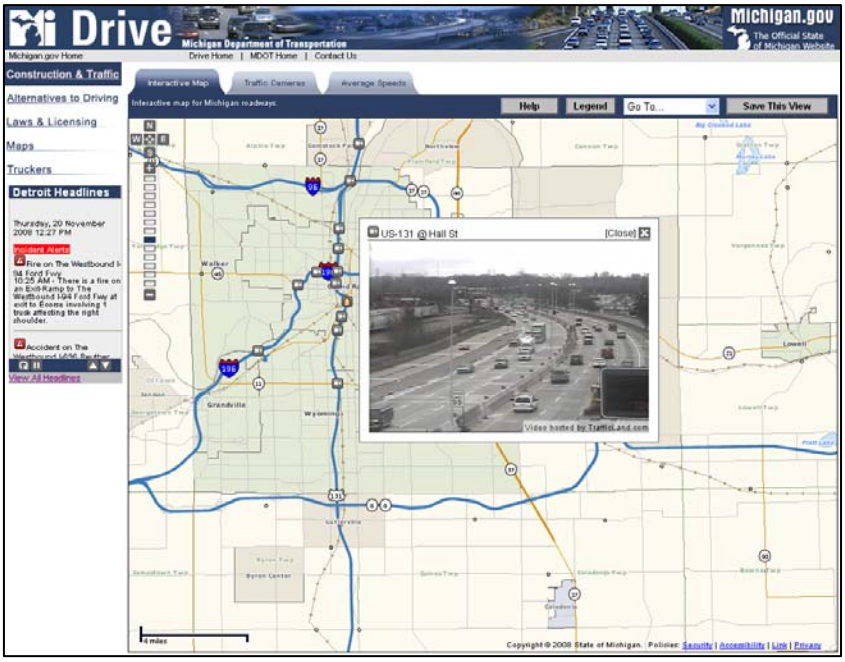

Figure 2. Mi Drive Website

5. ROAD CONSTRUCTION SUPPORT

The WMTMC supports the MDOT Grand Rapids Transportation Service Center (TSC) personnel in providing the best and most up-to-date construction and maintenance work zone information that affects the traveling public. Prior to the start of construction season, a meeting is held with TSC construction and maintenance staff to discuss operational procedures and

upcoming projects. Control Room Operators work regularly with project engineers to develop DMS messaging plans for work zones and determine how the WMTMC can assist in alerting drivers of current and upcoming conditions. DMS messaging may include information regarding upcoming lane/road closures or openings, active traffic impacts, detour or alternate route suggestions, or general mobility and traffic backup information.

When construction activities occur during control room hours, operators can monitor work zones for possible problems that may occur and modify DMS messages as necessary. For construction operations on weekends, messages are often scheduled to be activated at a certain date and time. These schedules are based on a plan developed in coordination with the MDOT project engineer. Since construction schedules can sometimes change with little or no notice, in these instances, GRPD Dispatch, which operates 24 hours per day, 7 days per week, can also assist by updating DMS messages as needed.

6. PLANNED SPECIAL EVENTS SUPPORT

The WMTMC provides expanded coverage for special events which occur outside of the normal hours of operation. Control Room Operators monitor traffic cameras for abnormal conditions, coordinate with GRPD and MSP regarding ramp and lane closures, and display DMS messages to assist in the flow of event traffic. The WMTMC regularly assists in traffic for the River Bank Run, the Fourth of July fireworks, and the Celebration on the Grand fireworks, all held in downtown Grand Rapids.

7. INCIDENT MANAGEMENT AND TRAFFIC INFORMATION

Notifications of incidents are sent by the WMTMC to a number of partners when incidents have a significant impact on traffic flow, including:

- Total closures on freeways and major arterials
- Multiple lane closures on freeways
- Freeway-to-freeway ramp closures

Control Room Operators use email to disseminate this important information to a large number of people at once, including but not limited to, law enforcement and emergency responders, MDOT personnel, and local media partners. Notifications are sent throughout the duration of these high impact incidents as conditions change, until the incident has cleared and all lanes and ramps have reopened. Table 2 summarizes the number of high impact incidents per month for which incident notifications were sent during FY 2008.

Incident	Average Month	Highest Month (May '08)	Lowest Month (Dec '07)
Lane Closures	11	20	3
Ramp Closures	1	-	1
Freeway Closures	1	1	-

Table 2. Closures Due To High Impact Incidents

Control Room Operators maintain an Event Log that is used to track incidents that occur during control room hours. During FY 2008, the Call Log was integrated into the Event Log providing a clear link between events and related calls. Incident data entered into the Event Log includes:

- Date and time of incident occurrence, emergency response arrival, and incident clearance
- Incident freeway and location
- Number and type of vehicles involved
- Impact on traffic
- Other important details regarding the incident

The WMTMC also logs other types of events, such as construction activities, atypical congestion, Ozone Action Days, AMBER Alerts, and special events. A breakdown of the number of events by category during FY 2008 is provided in Figure 3. The WMTMC Control Room Event Log interface screen was updated in FY 2008. An example of the Event Log interface is shown in Figure 4.

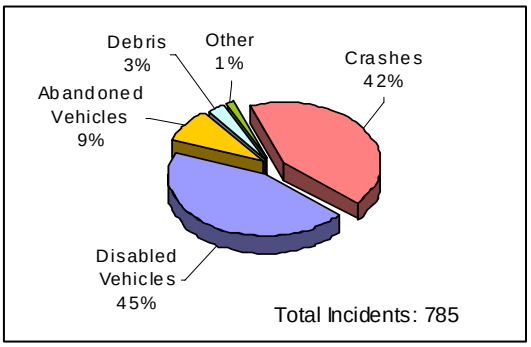

Figure 3. Distribution of WMTMC Control Room Logged Incidents

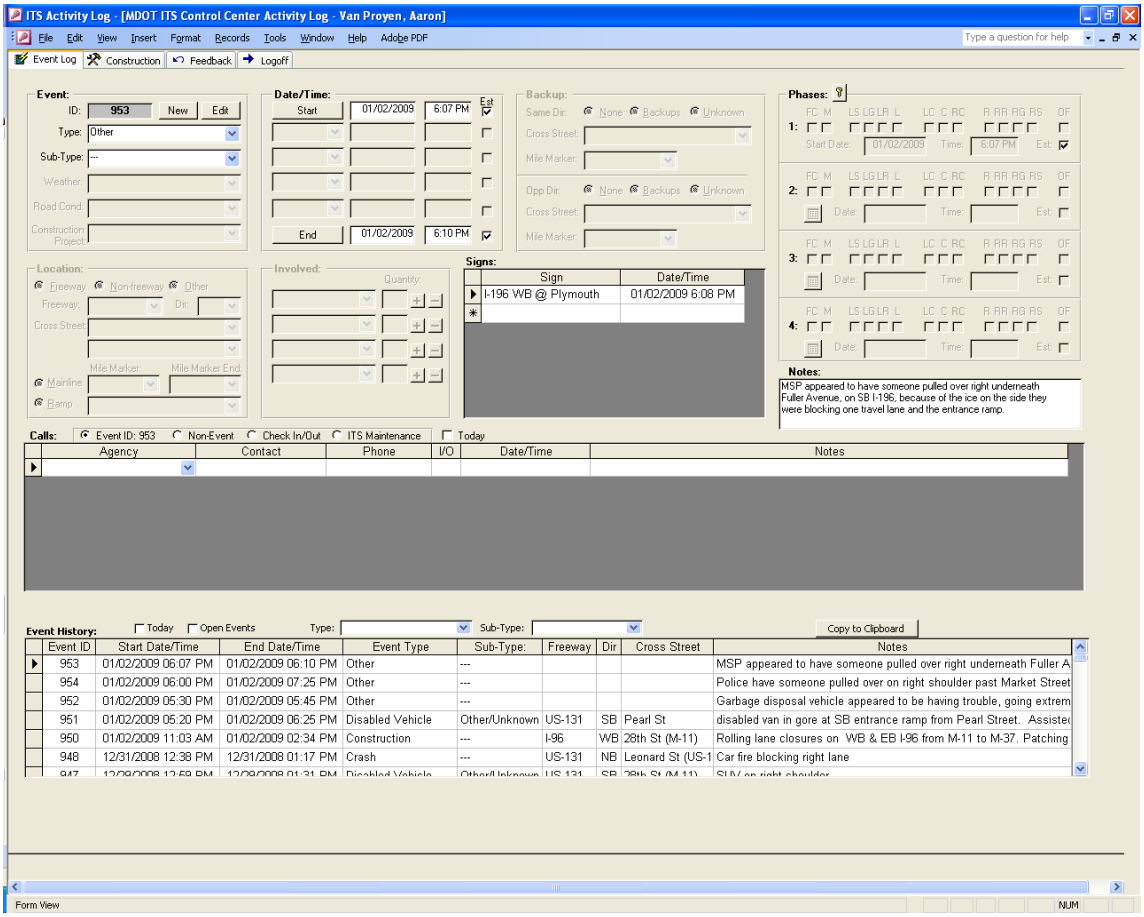

Figure 4. WMTMC Control Room Event Log

8. ITS DEPLOYMENT

Several projects are under development or planned for implementation during FY 2009. The following deployments will expand the ITS coverage in the Grand Rapids area, as well as in Ottawa County.

During FY 2008 more than 40 detectors were installed throughout the Grand Rapids area. Software is being developed so that the detectors will give Control Room Operators the ability to monitor traffic flow throughout the network, more quickly detect and verify incidents, and identify areas where congestion is occurring. The detectors will also allow for the calculation of vehicle travel times, which could be automatically displayed on signs along the freeways in the future. The detection system is expected to be online by spring of 2009.

Design work continued on the Grand Valley Metro Council (GVMC) ITS expansion project during FY 2008. The project, which is expected to begin in FY 2009 and be completed in FY 2010, will include traffic surveillance cameras, dynamic message signs, vehicle detectors, and traffic signal connections, which will be installed throughout Kent County on M-11, M-37, 44th Street, Division Avenue, and Patterson Avenue, as well as I-96, US-131, and I-196. The expansion project will allow the WMTMC to monitor new sections of freeways as well as arterial roadways throughout the area, and provide additional travel information to the motoring public.

In FY 2009, three traffic cameras and a dynamic message sign will be installed on US-31 near the bascule bridge in Grand Haven. These new devices will be used for incident management and detour routing at this critical river crossing.

Six additional traffic cameras and one dynamic message sign will also come online in the Grand Rapids area during FY 2009. The cameras will provide greater coverage on I-196, I-96, and US-131 and the DMS will provide travel information to drivers on eastbound I-96 west of the Grand Rapids area.

A state-wide ATMS software package is being developed for initial rollout in early FY 2010. The software will provide a single interface through which traffic cameras, dynamic message signs, and detectors can be controlled and monitored, in addition to the various control room logs and databases.

The WMTMC control room will be relocated within the existing MDOT Grand Region building in FY 2009. As part of the relocation, the control room will be equipped with a video wall for monitoring traffic cameras, work stations for four operators, two offices, a conference room, and a dedicated ITS equipment room.

9. SYSTEM MAINTENANCE

Maintenance services for the ITS field devices are provided by the City of Grand Rapids, except for those that are under warranty. Tables 3, 4, and 5 on the next page show the availability of each device during FY 2008.

Table 3. CCTV Camera Availability

	Camera	Full	Partial	None
1	US-131 @ 28th St	99%	1%	-
2	US-131 @ Franklin St	100%	-	-
3	US-131 @ Market Ave	100%	-	-
4	US-131 @ Pearl St	100%	-	-
5	US-131 @ I-196	100%	-	-
6	US-131 @ Leonard St	100%	-	-
7	US-131 @ Ann St	100%	-	-
8	US-131 @ I-96	100%	-	0%
9	US-131 @ Hall St	99%	0%	1%
10	US-131 @ West River Dr	92%	4%	4%
11	I-196 @ Chicago Dr	98%	0%	2%
12	I-196 @ Lake Michigan Dr	98%	0%	2%
13	I-196 @ Lane Ave	98%	0%	2%
14	I-196 @ College Ave	100%	0%	-
15	I-196 @ Fuller Ave	100%	-	-
16	I-96 @ I-196	99%	1%	-
17	I-96 @ Fulton St (M-21)	100%	-	-

Table 4. DMS Availability

	DMS	Full	Partial	None
1	WB I-96 @ Fulton St (M-21)	100%	-	0%
2	WB I-196 @ Chicago Dr	98%	-	2%
3	EB I-196 @ Plymouth Ave	99%	0%	1%
4	SB US-131 @ West River Dr	98%	1%	2%
5	SB US-131 @ Ann St	99%	1%	1%
6	NB US-131 @ Leonard St	100%	-	-
7	SB US-131 @ Pearl St	99%	0%	1%
8	SB US-131 @ Hall St	99%	0%	1%
9	NB US-131 @ 36th St	99%	0%	1%
10	NB US-131 @ 28th St	97%	1%	3%

Table 5. VSS Availability

	VSS	Full	Partial	None
1	SB US-131 @ Pearl St	99%	0%	0%
2	NB US-131 @ Market Ave	99%	0%	1%
3	SB US-131 @ Market Ave	99%	0%	1%
4	NB US-131 @ Franklin St	98%	0%	2%

During FY 2008 the WMTMC worked with the City of Grand Rapids and URS to develop a preventive maintenance plan for ITS field devices and communications system and a database to track maintenance activities. This will improve scheduling of preventive maintenance activities with the goal of keeping the system operational as much of the time as possible and reducing the need to repair devices on an emergency basis. The database will allow for more accurate tracking of maintenance and repair costs of ITS equipment, and will provide a detailed inventory.

10. CONCLUSIONS

The WMTMC provides important services to law enforcement, emergency responders, media partners, transportation agencies, and the motoring public in West Michigan. Continued expansion of the ITS network and developments in operations will allow the WMTMC to have an even greater impact on the performance and safety of local freeways and arterials. The WMTMC will strive to further strengthen interagency cooperation and collaboration throughout the region, and to provide enhancements to transportation operations and traveler information throughout the region.

APPENDIX A - FISCAL YEAR 2008 PERFORMANCE MEASURES REPORT

West Michigan TMC

Serving the Grand Rapids Area Freeways

Fiscal Year 2008

Suzette Peplinski, PE
Michigan Department of Transportation
1420 Front Avenue NW
Grand Rapids, MI 49504
PeplinskiS@michigan.gov

Control Room Coverage

The following report is limited to data collected during the hours of operation for the control room and within the ITS device coverage area.

Control Room Hours of Operation

Time Period	Days	Hours
October – April	Monday – Friday	6 am – 8 pm
	Saturday – Sunday	As needed
May – September	Monday – Thursday	6 am – 8 pm
	Friday	6 am – 9 pm
	Saturday	12 pm – 6 pm
	Sunday	4 pm – 8 pm
Special Events	All	As needed
Holidays and Holiday Weekends	New Years Day, Memorial Day, Independence Day, Labor Day, Thanksgiving, Christmas	As needed

ITS Device Locations and Coverage Area

Compiled by: URS

West Michigan TMC

Fiscal Year 2008

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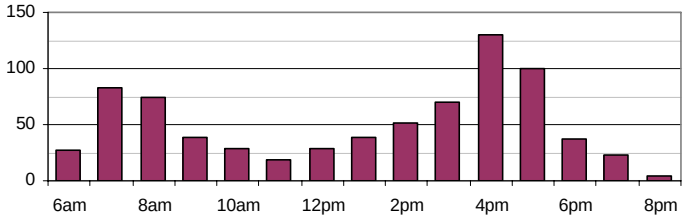
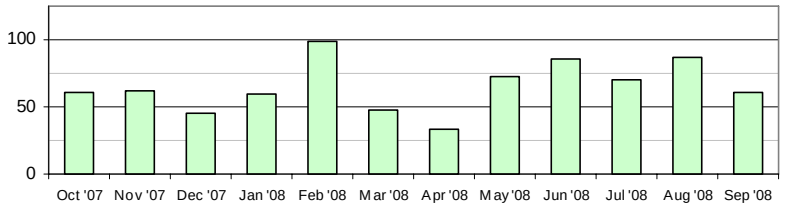
Control Room Support Activity

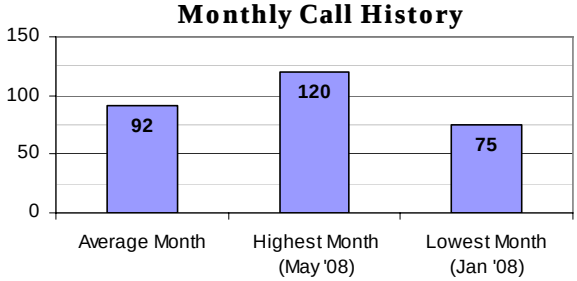
Unplanned Incidents per Weekday Hour



Monthly History of Unplanned Weekday Incidents



Monthly Call History



Monthly High Impact Unplanned Incident Activity

Incident	Average Month	Highest Month (May '08)	Lowest Month (Dec '07)
Lane Closures	11	20	3
Ramp Closures	1	-	1
Freeway Closures	1	1	-

Communications by Agency

Agency	Calls In	Calls Out	Calls Total	Emails In	Emails Out	Emails Total
City of Grand Rapids	0	0	0	300	0	300
City of Wyoming	0	4	4	0	0	0
Grand Rapids Police Department	46	721	767	0	0	0
Kent County Road Commission	5	19	24	7	1	8
MDOT, Construction	29	29	58	268	2	270
MDOT, Traffic/ITS	0	0	0	89	2	91
MDOT, Maintenance	11	7	18	130	1	131
MDOT, Other	4	7	11	340	1	341
Media	17	5	22	38	94	132
Michigan State Police	4	73	77	0	0	0
URS Corporation	16	15	31	74	10	84
ITS System Maintenance*	17	56	73	0	0	0
Weather**	0	0	0	349	0	349
Other	8	8	16	102	2	104
Fiscal Year Total	**157**	**944**	**1101**	**1697**	**113**	**1810**

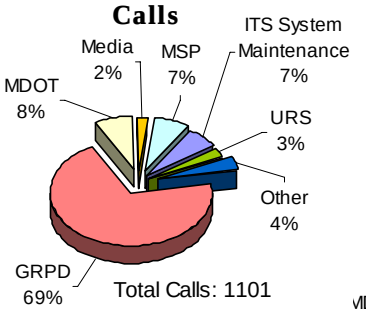
*All communications in this category were with the City of Grand Rapids
**No data was recorded in this category before Dec '07

Monthly Unplanned Incidents by Roadway

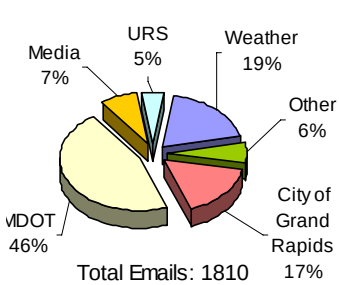
Freeway	Average Month Total	Average Month per mi.	Highest Month (Feb '08) Total	Highest Month (Feb '08) per mi.	Lowest Month (Apr '08) Total	Lowest Month (Apr '08) per mi.
I-96 (4.5 mi.)*	6	1.3	7	1.6	2	0.4
I-196 (8.5 mi.)*	18	2.1	39	4.6	15	1.8
US-131 (11 mi.)*	41	3.7	52	4.7	16	1.5
Total	65	2.7	98	4.1	33	1.4

*Mileages reflect the portion of the roadway within the coverage area.

Calls



Emails



Traffic Management Center News

Lee Nederveld left his position as Operations Supervisor of the West Michigan TMC to work for MDOT on ITS projects throughout Michigan. Wayne Burke replaced Lee as the Operations Supervisor, transferring from the MITS Center in Detroit where he was a control room operator for 10 years.

Ian Cutcher and Jared Cok both became Control Room Operators during FY 2008 and worked in the WMTMC on a part time basis. In addition to Ian and Jared, each of the Control Room Operators passed an operator's certification test, which ensures consistent knowledge of WMTMC policy and procedures among all operators.

More than 40 vehicle detectors were installed on area roadways during FY 2008. The detectors will give Control Room Operators the ability to monitor traffic flow throughout the network and calculate vehicle travel times, which could be displayed on DMS in the future.

Compiled by: URS

West Michigan TMC

Fiscal Year 2008

Serving the Grand Rapids Area Freeways

Suzette Peplinski, PE
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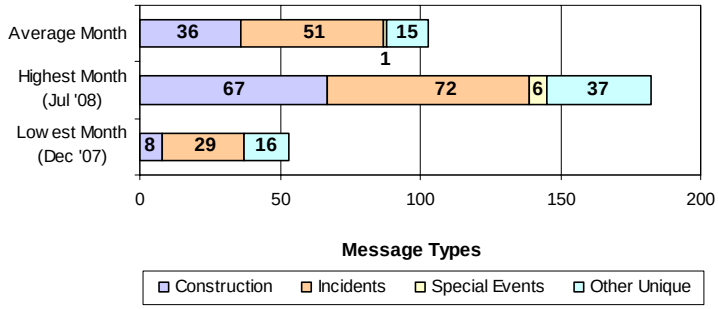
Traveler Information Activity

- The MDOT ITS Control Room provides traffic information to freeway users via 10 dynamic message signs (DMS) positioned in key locations along the freeway system in the greater Grand Rapids area.

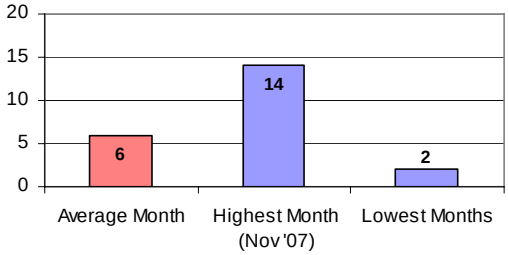
Unique DMS Messages by Type



Top Three Utilized DMS

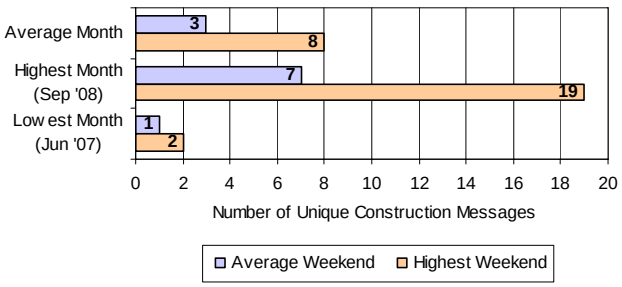
1. Southbound US-131 at Ann Street
2. Northbound US-131 at 28th Street
3. Eastbound I-196 at Chicago Drive

Incident Notification History



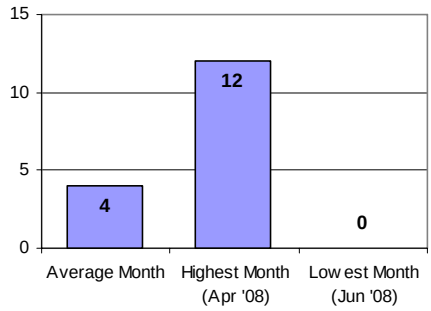
Construction Management Information

Weekend Construction* DMS Message Activity



*Includes Friday, Saturday and Sunday; Excludes December thru March.

Incidents Occurring in Construction Zones*



*Excludes December thru March.

Compiled by: URS

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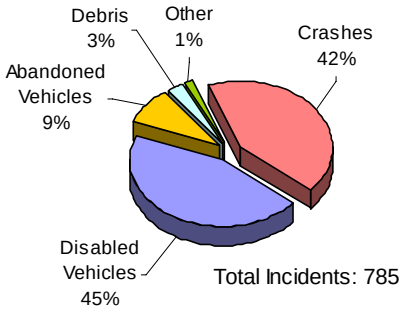
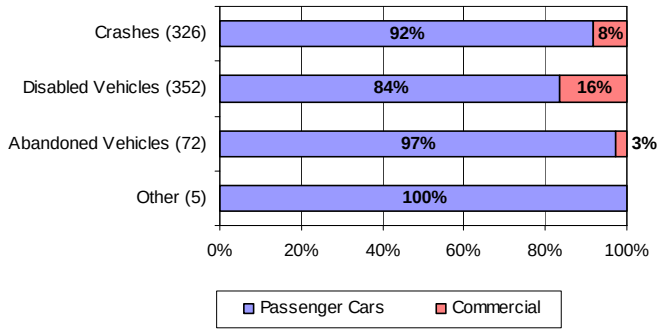
Incident Management Information

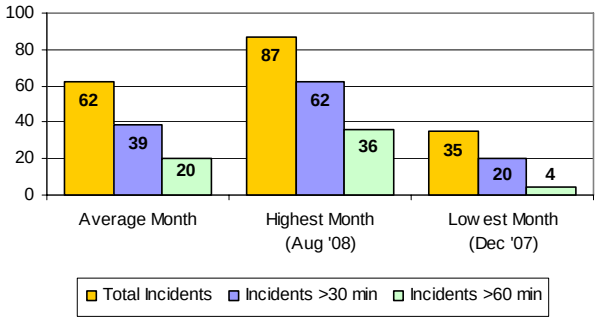
Total Incidents Managed by Type



Vehicle Composition of Incidents

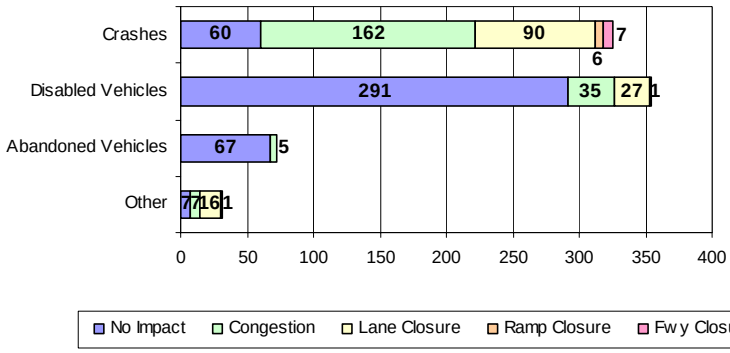


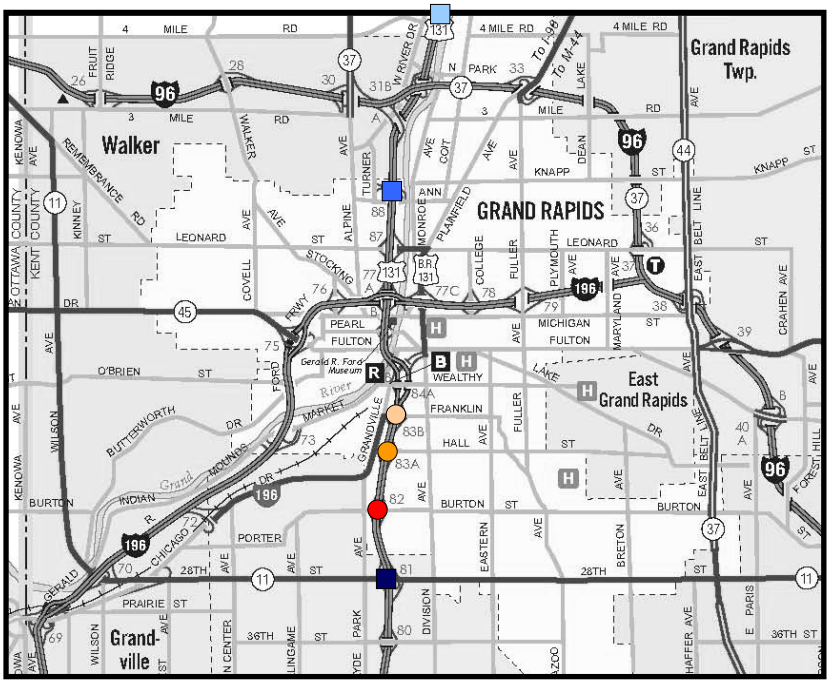
Incident Duration History*



Incident Duration History does not include abandoned vehicles.

Traffic Impacts by Incident Type





Incident Hot Spots

- 30 crashes
- 27 crashes
- 22 crashes

- 28 disabled vehicles
- 27 disabled vehicles
- 26 disabled vehicles

Compiled by: URS

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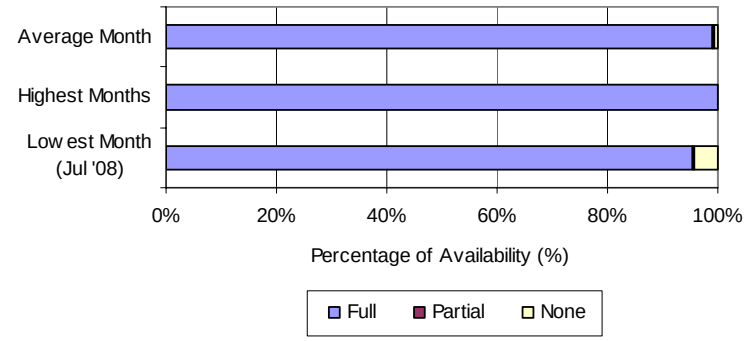
ITS Field Infrastructure Reliability

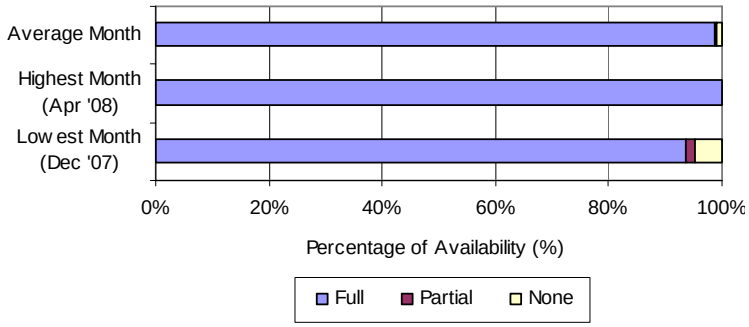
Overall Camera System Availability



Individual CCTV Camera Availability

	Camera	Full	Partial	None
1	US-131 @ 28th St	99%	1%	-
2	US-131 @ Franklin St	100%	-	-
3	US-131 @ Market Ave	100%	-	-
4	US-131 @ Pearl St	100%	-	-
5	US-131 @ I-196	100%	-	-
6	US-131 @ Leonard St	100%	-	-
7	US-131 @ Ann St	100%	-	-
8	US-131 @ I-96	100%	-	0%
9	US-131 @ Hall St	99%	0%	1%
10	US-131 @ West River Dr	92%	4%	4%
11	I-196 @ Chicago Dr	98%	0%	2%
12	I-196 @ Lake Michigan Dr	98%	0%	2%
13	I-196 @ Lane Ave	98%	0%	2%
14	I-196 @ College Ave	100%	0%	-
15	I-196 @ Fuller Ave	100%	-	-
16	I-96 @ I-196	99%	1%	-
17	I-96 @ Fulton St (M-21)	100%	-	-

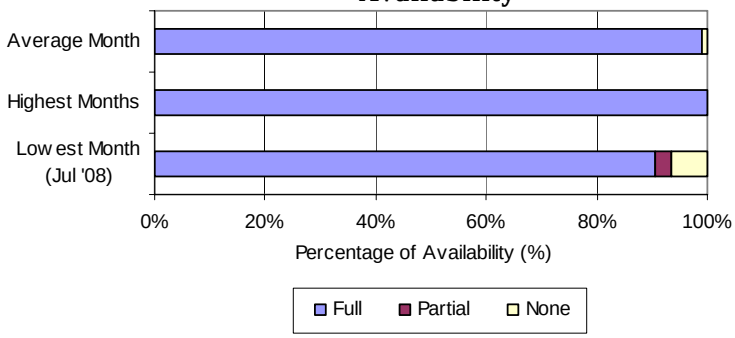
Overall DMS System Availability



Individual Dynamic Message Sign Availability

	DMS	Full	Partial	None
1	WB I-96 @ Fulton St (M-21)	100%	-	0%
2	WB I-196 @ Chicago Dr	98%	-	2%
3	EB I-196 @ Plymouth Ave	99%	0%	1%
4	SB US-131 @ West River Dr	98%	1%	2%
5	SB US-131 @ Ann St	99%	1%	1%
6	NB US-131 @ Leonard St	100%	-	-
7	SB US-131 @ Pearl St	99%	0%	1%
8	SB US-131 @ Hall St	99%	0%	1%
9	NB US-131 @ 36th St	99%	0%	1%
10	NB US-131 @ 28th St	97%	1%	3%

Overall VSS System Availability



Individual Variable Speed Sign Availability

	VSS	Full	Partial	None
1	SB US-131 @ Pearl St	99%	0%	0%
2	NB US-131 @ Market Ave	99%	0%	1%
3	SB US-131 @ Market Ave	99%	0%	1%
4	NB US-131 @ Franklin St	98%	0%	2%

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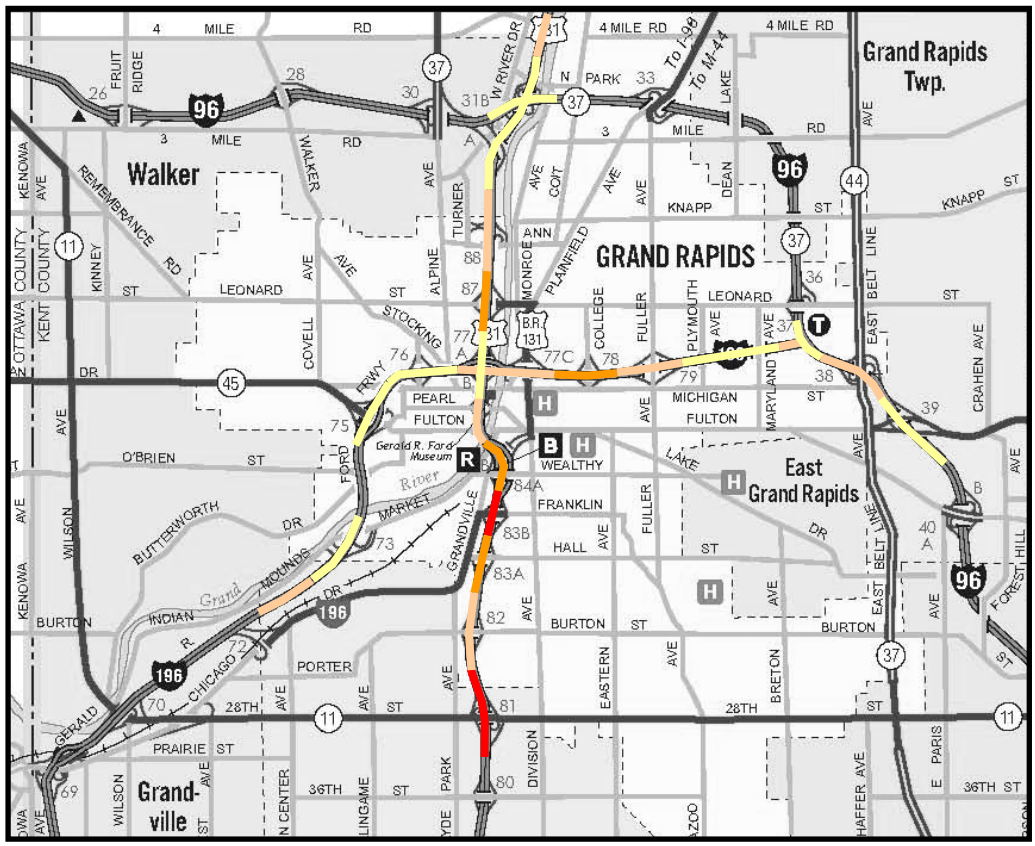
Safety Summary

Incident Density by Freeway Segment



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